HIL TESTING
INDEPENDENT SOFTWARE TESTING

Hardware-In-the-Loop (HIL) testing
Marine Cybernetics utilizes Hardware-In-the-Loop (HIL) technology to test and verify control systems using our CyberSea Simulator Technology. HIL testing is commonly used in automotive and aerospace industries as the best practice method for testing of control systems. HIL testing results in a more thorough and relevant verification of the control system compared to other available solutions, allowing efficient simulation of scenarios that are difficult, dangerous or expensive to test in real life.

Benefits of HIL testing
HIL testing will reduce the risk of delays during commissioning, and significantly reduce the risk of off-hire costs due to software errors occurring during operations.

HIL testing by Marine Cybernetics secures your control systems performance according to class rules, regulations, user requirements and functional descriptions. Numerous failures that may occur during operations are simulated, and failure handling capabilities of the control system are thoroughly tested utilizing our CyberSea Simulator technology. Earlier, deeper and broader testing is the fundamental nature of HIL testing, and will give you payback during both commissioning and operation.

How is HIL testing accomplished
HIL testing is accomplished by connecting the control system to a vessel specific simulator of the ship or offshore installation. The control system is then tested in realistic operating conditions and failure scenarios based on a vessel specific test program that incorporates the actual equipment, design and operational philosophy of the vessel.

Typical DP-HIL testing procedure
1. **Test at Factory:** The DP control system is extensively tested for about one week at the supplier site, usually coordinated with the FAT. Modifications and corrections can then be made prior to installation on-board the vessel.
2. **Test at Dock:** Integrated HIL testing is done at the yard. Marine Cybernetics arrives at the vessel with the testing equipment, and connects to the control system. This test typically takes 2 or 3 days, and is conducted in parallel with the building process. It does not disturb the normal building schedule.
3. **Test at Sea:** Finally, the control system is tested during sea trials for 10-18 hours.

FACTS
FMEA is a highly valuable to analyze redundancy of hardware on DP vessels. HIL testing bridges the gap between FMEA of hardware components and software based systems.

Marine Cybernetics offers HIL testing for the following systems:
- **Dynamic Positioning Systems**
- **Power Management Systems**
- **Steering, Propulsion and Thruster Control Systems**
- **Crane Control Systems**
- **Drilling Control Systems**
- **Integrated Automation Systems**
- **Other mission-critical control systems on request.**

In addition to HIL testing we offer FMEA and consultancy services.

ABOUT MARINE CYBERNETICS
Marine Cybernetics specializes in independent HIL testing of control systems for the maritime, oil and gas markets.

Marine Cybernetics is ISO 9001 certified, and delivers HIL testing in compliance with DNV's Standard for Certification of HIL testing. Marine Cybernetics is a member of IMCA.

PIONEERS IN SOFTWARE TESTING

MARINE CYBERNETICS

Vestre Rosten 77
NO-7075 Tiller
Norway

T +47 72 88 43 30
F +47 72 88 43 31

contact@marinecyb.com
www.marinecyb.com